



enocean® alliance

No Wires. No Batteries. No Limits.

***EnOcean technology for
intelligent and green buildings.***

Author

- Why wireless & batteryless?
- EnOcean – the batteryless wireless technology
- Installation
- Radio: Basics & range planning
- Support & next steps

Current state with many installations



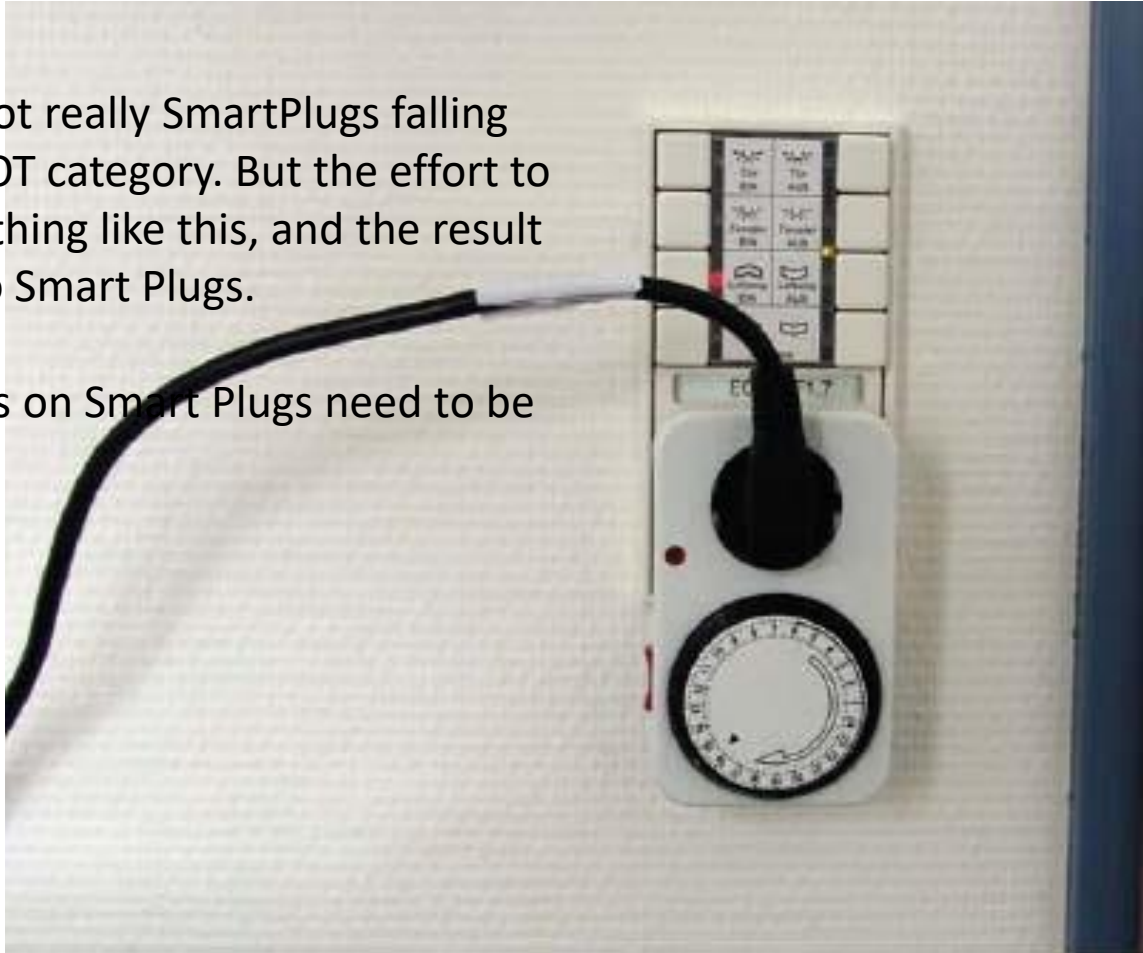
Current state



Current state

These are not really SmartPlugs falling under the IOT category. But the effort to make something like this, and the result was close to Smart Plugs.

More details on Smart Plugs need to be found out



Current state

To control a lot of different equipments, Eg: two remotes for controlling the tv, but 1 is specifically used for tv switchOnOff and other for the set-top box



Cable: expensive & inflexible

Conventional wiring solutions



- Time consuming
- Material-intensive
- Building Mess & Noise
- **Inflexible:** This term is used, because this inserting wires in to the building walls need to be done before hand. And in case, you need to change the wiring then probably, you can still use the smallPathsInstalledForTheWires but the wiring system would need upgrade. Recall previous
- Expensive Over Building Lifespan
- High costs with retrofitting (add (a component or accessory) to something that did not have it when manufactured.) **and change of use**

Conventional wireless technology requires batteries



Batteries require:

- Monitoring & Tracking for the battery level
- Stocking
- Access and replacement
- Costly Disposal for planet.

Batteries :

- Cause Pollution
- Require regular replacement

Customer wishes and modern house technology requirements



- Easy use and install
- Suitable for simple and complex applications
- Simple function changes possible
- Upgradeable, expandable and flexible at any time
- Adaptable to technical innovations
- Wide range of products and manufacturers
- Good price/performance ratio

The solution: EnOcean standard



Batteryless , wireless standard from EnOcean for intelligent buildings

- High degree of flexibility
- Comfort & security
- Cost-saving
- Reliable, future-proof technology
- Energy efficiency
- Low/No Maintenance
- No wiring required for sensors

Involving no battery here in regards to sensors and actuators would mean that they would be capable to generate their own energy

EnOcean – your chance in the installer market



- Shift to system business
- Better distinction from the competition (unique characteristics)
- Easy entry in EnOcean technology possible
- Additional business (scalable offering - from small installations to automation)
- Ready for law reforms, e.g. the EnEV 2014 in Germany

- Why wireless & batteryless?
- EnOcean – the batteryless wireless technology
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- Support & next steps

EnOcean – the radio standard for green buildings



■ No Wires

- more than 1,200 interoperable products
- International radio standard (ISO/IEC)
- ISO/IEC JTC 1



■ No Batteries

- Maintenance free
- Environmentally friendly



■ No Limits

- Maximum flexibility
- More than 250,000 equipped buildings



enocean
Search term

zigbee
Search term

z-wave
Search term

Bluetooth Low Ene...
Topic



Worldwide ▾

Past 12 months ▾


All categories ▾

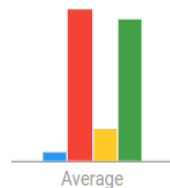
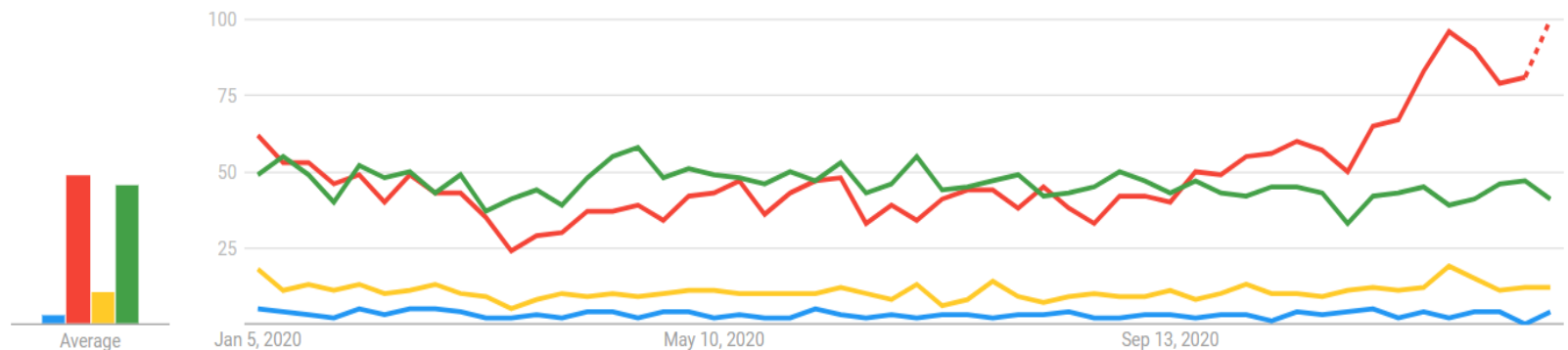
Web Search ▾

Note: This comparison contains both Search terms and Topics, which are measured differently.

[LEARN MORE](#)

EnOcean's
popularity
is very low

Interest over time 



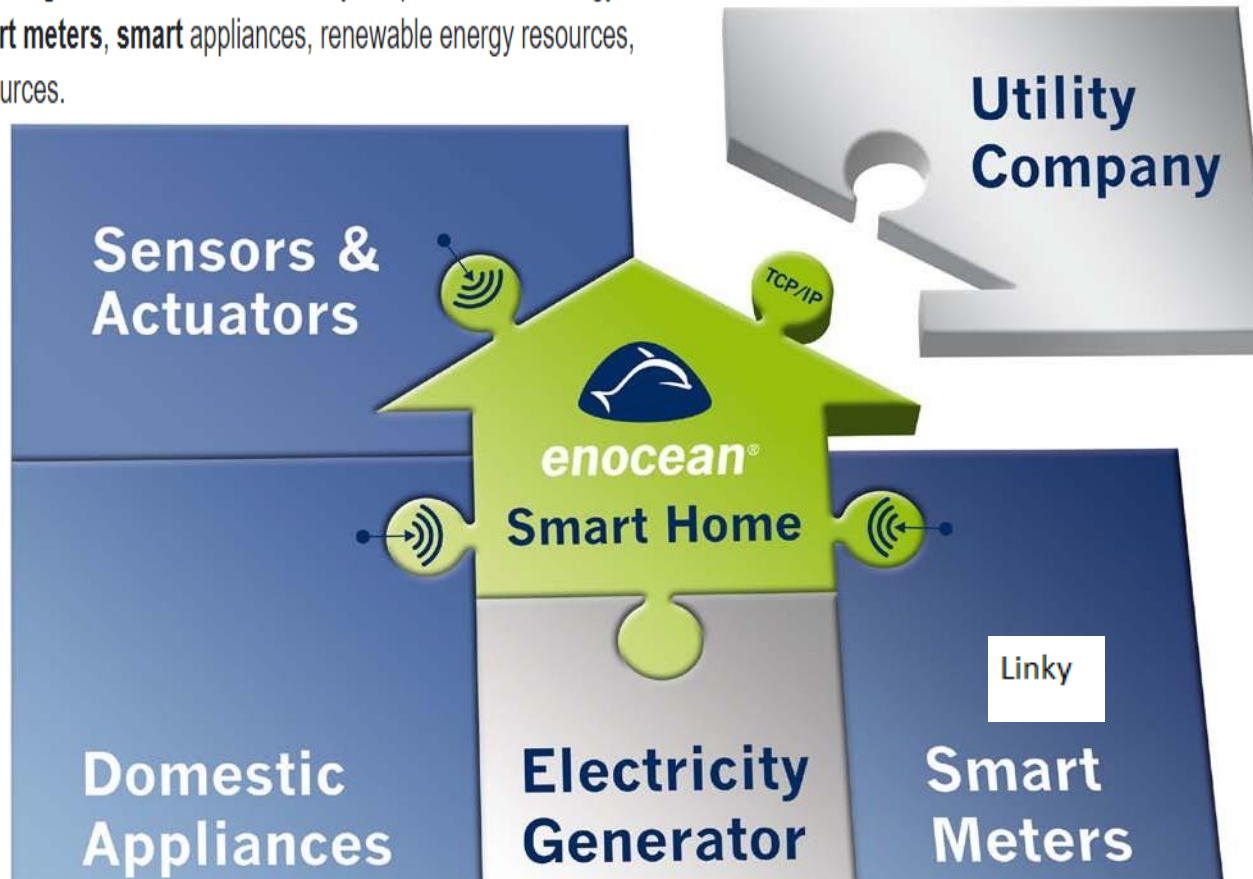
Batteryless wireless technology for residential markets/ smart homes



EnOcean – the basis for smart homes and building automation



A **smart grid** is an electrical **grid** which includes a variety of operation and energy measures including **smart meters**, **smart** appliances, renewable energy resources, and energy efficient resources.



Utility company may reduce the temperature by 1 degreeCelsius in 10000 homes and thus save a lot of energy and finally sell it to the energv

Eg: washing Machine

An **electric generator** is a device that converts mechanical energy obtained from an external source into **electrical** energy as the output. ... Faraday discovered that the above flow of **electric** charges could be induced by moving an **electrical** conductor, such as a wire that contains **electric** charges, in a magnetic field.

Batteryless wireless technology for building automation



Batteryless wireless light sensors automatically match lighting to daylight.

Batteryless wireless Position sensors setback HVAC when windows are opened.

Heating valve for self-powered and energy-efficient room temperature control.

Batteryless wireless switches control lighting and shading.

Room Controller/ Gateway/ BMS

Batteryless wireless Room temperature sensor for minimal energy consumption and maximum comfort.

Batteryless wireless Occupancy sensor adjusts temperature and turns off lights when a room is not in use.

➔ **YOUR PAYBACK/ROI**

- 15% cost savings in new construction
- 70% cost savings in retrofits
- 40% energy savings
- Unlimited Flexibility

No wires

No Battery

<https://www.enocean.com/en/products/>
Batteryless wireless technology from EnOcean
= energy harvester + radio modules



Power Delivery (PD) is a specification for handling higher power and allows a range of devices to charge quickly over a USB connection. May 14, 2018

Energy Harvesting Wireless Sensor Module STM 310

Wireless Transceiver Module TCM 320

Energy Harvesting Wireless Sensor Module STM 300

ECO 200 & PTM 330 Energy Harvesting Wireless Sensor Module STM 320

Energy Harvesting Wireless Actuator STM 300 & ECT 310

Energy Harvesting Wireless Switch Module PTM 200

So, if I remember, EnOcean solutions are part of BuildingAutomation. Now, along with BuildingAutomation Solutions, these mentioned products can be sold separately.

➔ **BENEFITS FOR PRODUCT MANUFACTURERS** Easy to integrate because it's kinda plug&play

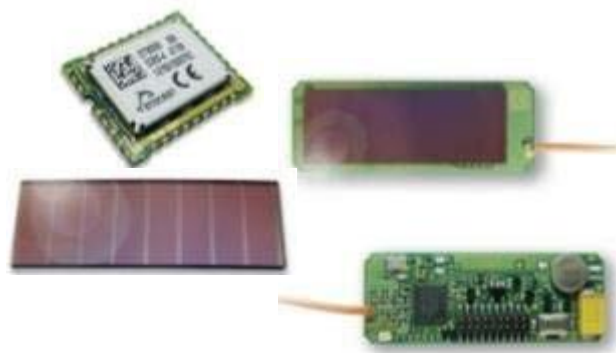
- Maintenance-free sensor solutions
- Easy to integrate
- Faster time-to-market
- Interoperability of end-products interoperable at-least with EnOcean products

© EnOcean Alliance | Intelligent and Green Buildings | 2014

Energy Harvesting



Kinetic energy
Electrodynamic generator



Solar energy
Module with energy storage



Thermal energy
Energy generation through temperature differences



Basics of EnOcean radio



EnOcean radio

- Energy generation through press of a button, light, differences in temperature
- Wireless protocol: EnOcean **ISO/IEC-Standard 14543-3-10**
- Frequency: license-free frequency band under 1 GHz (868 MHz in Europe and China, 902 MHz in North America, 928 MHz in Japan)
- uni/bidirectional communication

Range

- About 30m in buildings
- Range extension with repeaters (Level 1 and Level 2)

Transmission security

- short telegrams ~ 1ms
- 2 asynchronous repetitions
- Encryption and Rolling Code (authentication)

Interoperability

- each transmitter has an unique address (32Bit-ID)
- standardized protocol and sensor profiles (EEP)

EnOcean Equipment Profiles (EEP's)

EnOcean is more environmentally friendly – than any other wireless devices

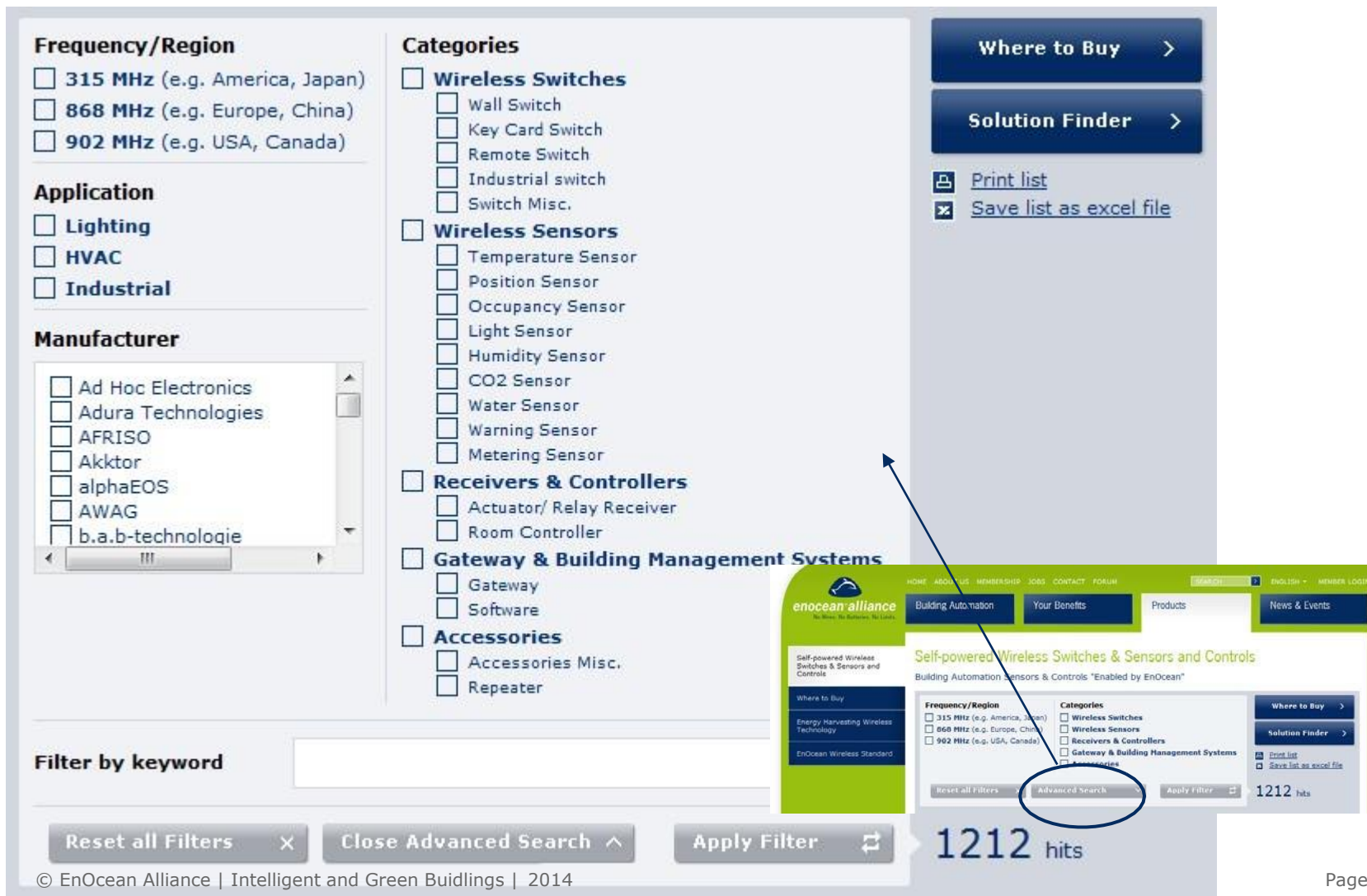
The "watt per square meter" is the SI unit for radiative and other energy fluxes in geophysics. The "solar constant", the solar irradiance at the mean earth-sun distance is approximately 1370 $W m^{-2}$.



COMPARISON OF HIGH FREQUENCY DEVICES

Device/ System	W/m ²	Distance (m)	Duration
EnOcean wireless switch	0,000013	1	few ms during actuation
Convent. light switch	0,0015	1	few ms during actuation
WiFi Access Point	0,01	2	during data exchange
Network card	0,1	0,5	during data exchange
DECT telephone	1	0,1	during phone call
Cell phone	12-42	0,1 average	during phone call
Cellular base station	0,00001 - 0,1		diverse permanence

EnOcean-based products – www.enocean-alliance.org/products



The screenshot displays the EnOcean Alliance product search interface. On the left, there are three filter sections: **Frequency/Region** with checkboxes for 315 MHz (e.g. America, Japan), 868 MHz (e.g. Europe, China), and 902 MHz (e.g. USA, Canada); **Application** with checkboxes for Lighting, HVAC, and Industrial; and **Manufacturer** with a scrollable list including Ad Hoc Electronics, Acura Technologies, AFRISO, Akktor, alphaEOS, AWAG, and b.a.b-technologie. In the center, the **Categories** section lists various product types with checkboxes: Wireless Switches (Wall Switch, Key Card Switch, Remote Switch, Industrial switch, Switch Misc.), Wireless Sensors (Temperature Sensor, Position Sensor, Occupancy Sensor, Light Sensor, Humidity Sensor, CO2 Sensor, Water Sensor, Warning Sensor, Metering Sensor), Receivers & Controllers (Actuator/ Relay Receiver, Room Controller), Gateway & Building Management Systems (Gateway, Software), and Accessories (Accessories Misc., Repeater). On the right, there are buttons for **Where to Buy** and **Solution Finder**, along with links to **Print list** and **Save list as excel file**. At the bottom, a **Filter by keyword** search bar is present, followed by buttons for **Reset all Filters**, **Close Advanced Search**, and **Apply Filter**. The search results section on the right shows a list of products under the heading **Self-powered Wireless Switches & Sensors and Controls**, with a sub-heading **Building Automation Sensors & Controls "Enabled by EnOcean"**. The results are filtered by the same categories and frequency/region options. The total number of hits is displayed as **1212 hits**. An inset image shows a smaller version of the search interface with a blue arrow pointing to the **Advanced Search** button, which is circled in red.

Frequency/Region

- ☐ 315 MHz (e.g. America, Japan)
- ☐ 868 MHz (e.g. Europe, China)
- ☐ 902 MHz (e.g. USA, Canada)

Application

- ☐ Lighting
- ☐ HVAC
- ☐ Industrial

Manufacturer

- ☐ Ad Hoc Electronics
- ☐ Acura Technologies
- ☐ AFRISO
- ☐ Akktor
- ☐ alphaEOS
- ☐ AWAG
- ☐ b.a.b-technologie

Categories

- ☐ **Wireless Switches**
 - ☐ Wall Switch
 - ☐ Key Card Switch
 - ☐ Remote Switch
 - ☐ Industrial switch
 - ☐ Switch Misc.
- ☐ **Wireless Sensors**
 - ☐ Temperature Sensor
 - ☐ Position Sensor
 - ☐ Occupancy Sensor
 - ☐ Light Sensor
 - ☐ Humidity Sensor
 - ☐ CO2 Sensor
 - ☐ Water Sensor
 - ☐ Warning Sensor
 - ☐ Metering Sensor
- ☐ **Receivers & Controllers**
 - ☐ Actuator/ Relay Receiver
 - ☐ Room Controller
- ☐ **Gateway & Building Management Systems**
 - ☐ Gateway
 - ☐ Software
- ☐ **Accessories**
 - ☐ Accessories Misc.
 - ☐ Repeater

Where to Buy >

Solution Finder >

[Print list](#)

[Save list as excel file](#)

Filter by keyword

Reset all Filters **Close Advanced Search** **Apply Filter**

1212 hits

Self-powered Wireless Switches & Sensors and Controls

Building Automation Sensors & Controls "Enabled by EnOcean"

Frequency/Region

- ☐ 315 MHz (e.g. America, Japan)
- ☐ 868 MHz (e.g. Europe, China)
- ☐ 902 MHz (e.g. USA, Canada)

Categories

- ☐ Wireless Switches
- ☐ Wireless Sensors
- ☐ Receivers & Controllers
- ☐ Gateway & Building Management Systems
- ☐ Accessories

Where to Buy >

Solution Finder >

[Print list](#)

[Save list as excel file](#)

1212 hits

Multi-vendor interoperable solution for residential buildings/ smart homes

Switches and Sensors



Actuators



Central Units



LAN/WLAN



Multi-vendor interoperable solutions for building automation

Switches and Sensors



Actuators



LAN/WLAN

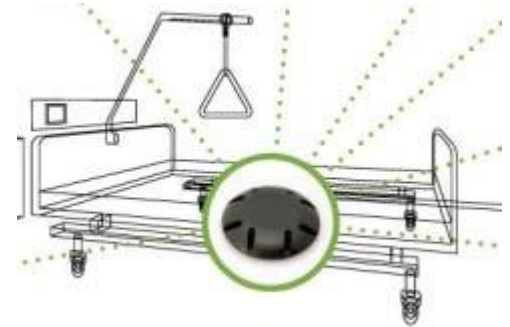


Building automation



Further applications with EnOcean

- Pressure sensors for furniture and mattresses
- Handheld transmitters for door operators
- Mousetraps
- Bus stop buttons
- Industrial switches
- Cable harness sensors
- Avalanche protection sensors
-



References for residential buildings/ smart homes



EnOcean is worthwhile, from the first
Switch-Receiver-Combination in:

- Apartments
- Detached and semi-detached homes
- Prefabricated houses
- Small commercial properties (e.g. practices, offices)



Over 250.000 buildings worldwide –“enabled
by EnOcean”



Offices



Hospitals



Industrial buildings



Residential buildings



Hotels



Historical buildings



Stores



Schools/ Universities

Activities of the EnOcean Alliance



- **Basis is the wireless standard for self-powered wireless applications**
 - ISO/IEC Standard 14543-3-10
 - Application profiles EnOcean Equipment Profiles (EEP)
- **Secures interoperability of Endproducts**
- **More than 350 members**
 - Product manufacturers
 - System integrators
 - Specifiers, architects
 - Installers
- **Worldwide activities and networks**



Benefits for installers and specifiers



- Easy installation
- Easy planning and highest flexibility through freely positionable sensors
- Less noise and dirt
- Upgradeable and extendable at any time
- Wide range of interoperable products from various manufacturers
- Reliable and future-proof technology

- Why wireless & batteryless?
- EnOcean – the batteryless wireless technology
- **Installation**
- Radio: Basics & range planning
- Support & next steps

Easy installation: 1x Switch and 1x Receiver

■ Step 1:

- Connect electrical loads with actuators (luminaires, shutters, sockets, heating valves).



■ Step 2:

- Link switches and sensors once using the easy teach-in mode in the actuator.



■ One base installation = many functions

An **actuator** is a device that uses a form of power to convert a control signal into mechanical motion. From electric door locks in automobiles, to ailerons on aircraft, **actuators** are all around us.

Philips Hue is a line of color changing LED lamps and white bulbs which can be controlled wirelessly. The Phillips Hue line of bulbs was the first smart bulb of its kind on the market.

Easy installation: optional extension

■ Step 3 (optional)

- Visualization with Touch-Panel
- Connecting video cameras
- Connection to the internet (Smart phone/PDA/Tablet)



Advantages for your clients

■ More comfort

- Central functions
- Scenes
- Automation
- Visualization/Touch-Panel

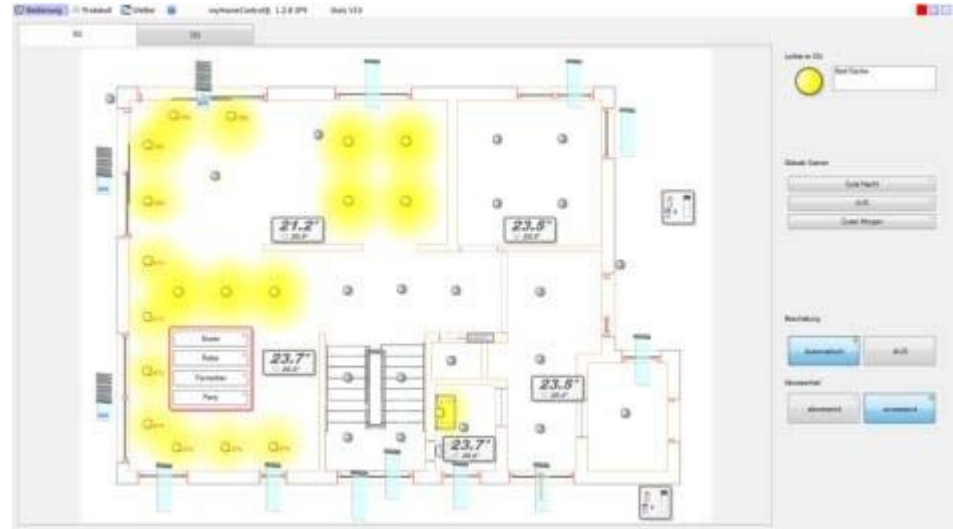
■ More security

- Window monitoring
- Panic button
- Presence simulation

■ More energy efficiency

- Heating control combined with window monitoring
- Individual zone regulation/individual room control

...with user-friendly technology!



Advantages for the user: flexibility

Changes in the house – position switches in any location

■ In case of changes in furnishing

- New furniture
- New room layout

■ Conversion

- Office room
- Nursery
- Nursing care

■ Simple retrofit

- Handheld switch
- Additional switches
- Connection to exterior lighting
- Pump in the garden pond



Freely positionable switches



Nursery – the switch is glued directly next to the bed – it's safe as well as there is no direct electrical connection

Freely positionable switches – furniture



Bedroom – switch next to the bed

Freely positionable switches – glass



Bathroom – the switch can be next to the bath or shower

Remote control – scenes



Control blinds, dim lights, open doors

Remote control – garage door



More comfort with remote control

■ Control Lighting

- Central on/off
- Scenes

■ Control Blinds

- Single/groups
- Central on/off

■ Control Multimedia

■ Heating Control



Decentralized control – Blinds



■ Ideal for retrofits

- No cables
- Switches freely positionable

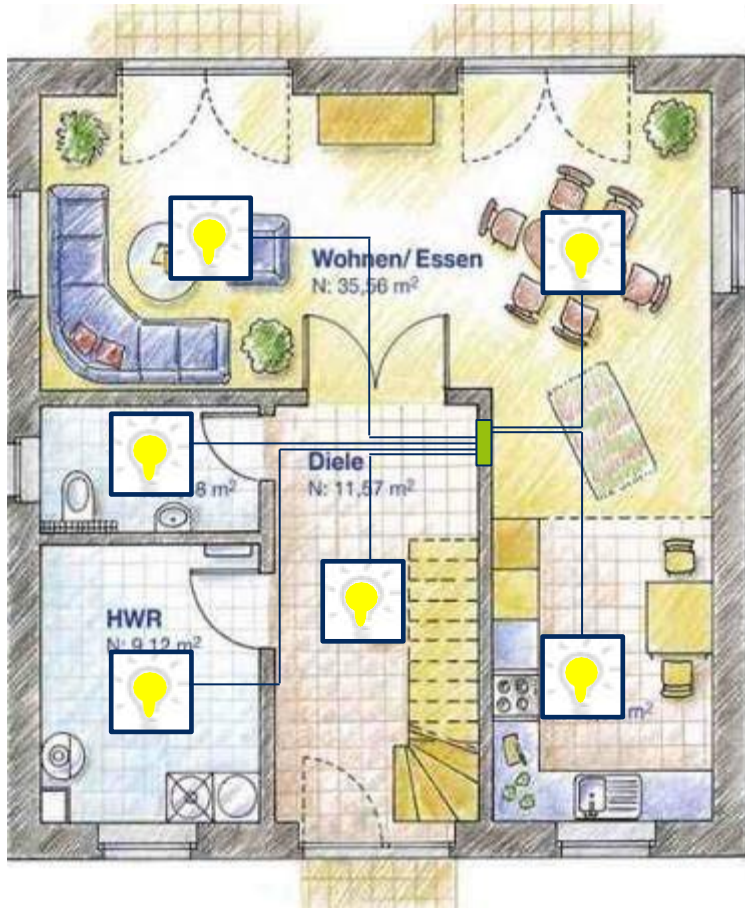
■ Functions

- Individual control
- Group control
- Central control
- Automation
- Dimming
- Light scenes

Components



Decentralized control – Lighting



Components

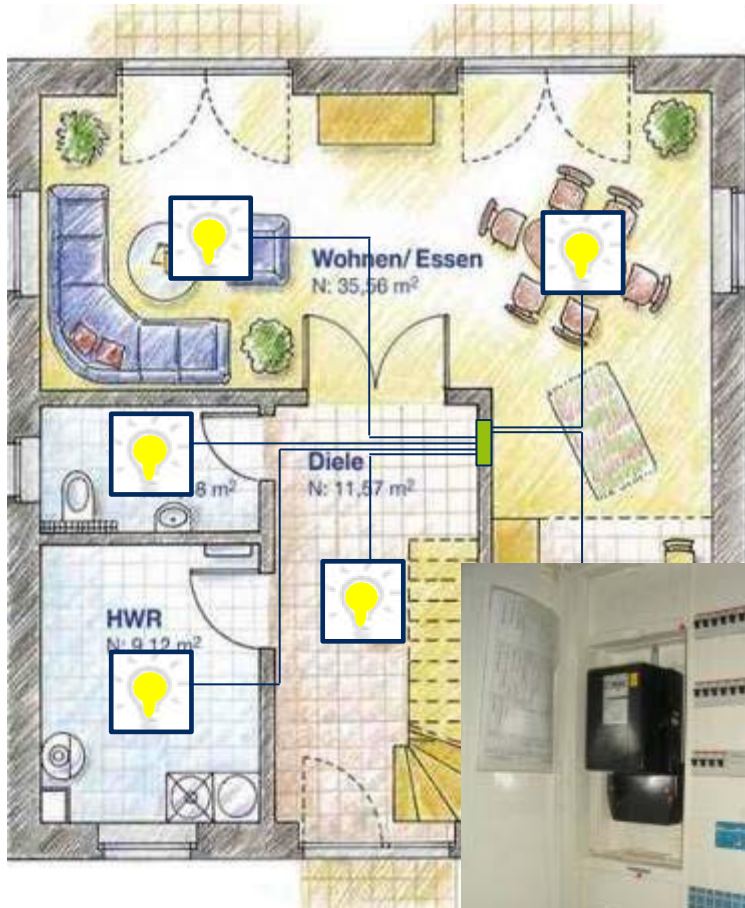


Switching actuators



Switches

Central control – easily expandable

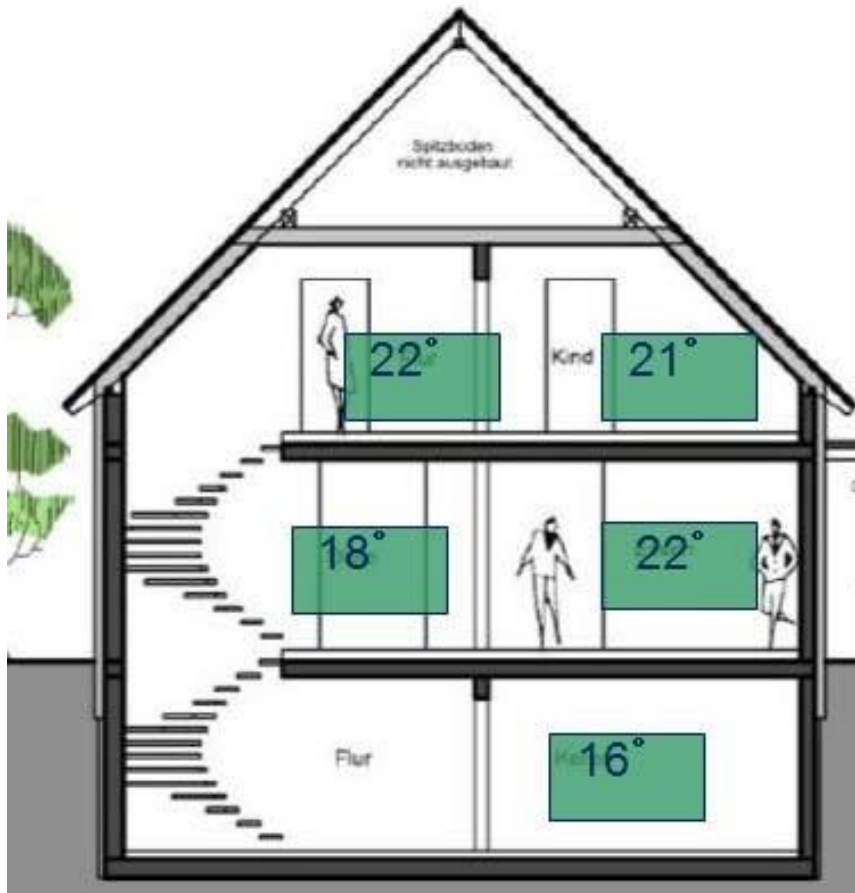


■ Functions

- Individual control
- Group control
- Central control
- Automation
- Dimming
- Light scenes



Individual heating control



■ Functions

- Timer
- Heating times programmable
- Remote access possible

Components



Thermostats



Switching
actuators for
heating valves

Residential house in Schorndorf



Modern residential house

■ Problem

- Running cables difficult – exposed concrete

■ Solution

- EnOcean-based switches and thermostat

■ Advantages

- Flexibility
- Easy installation
- Lower costs



Prefabricated houses with EnOcean technology



50% of all WeberHaus buildings are equipped with EnOcean technology

WeberHaus
Die Zukunft bauen



Commercial buildings: connection to bus systems

Switches and sensors



Actuators



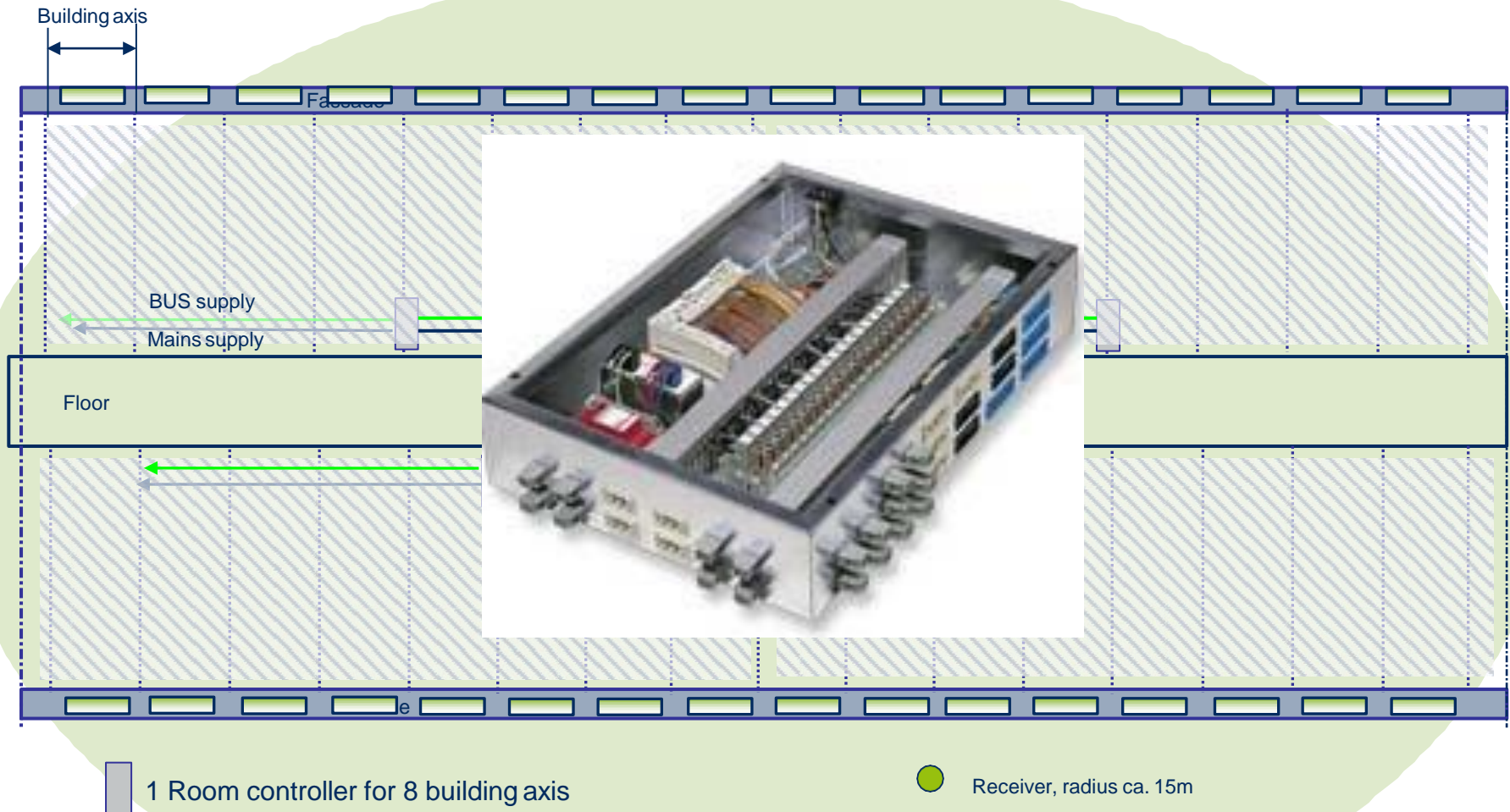
LAN/WLAN



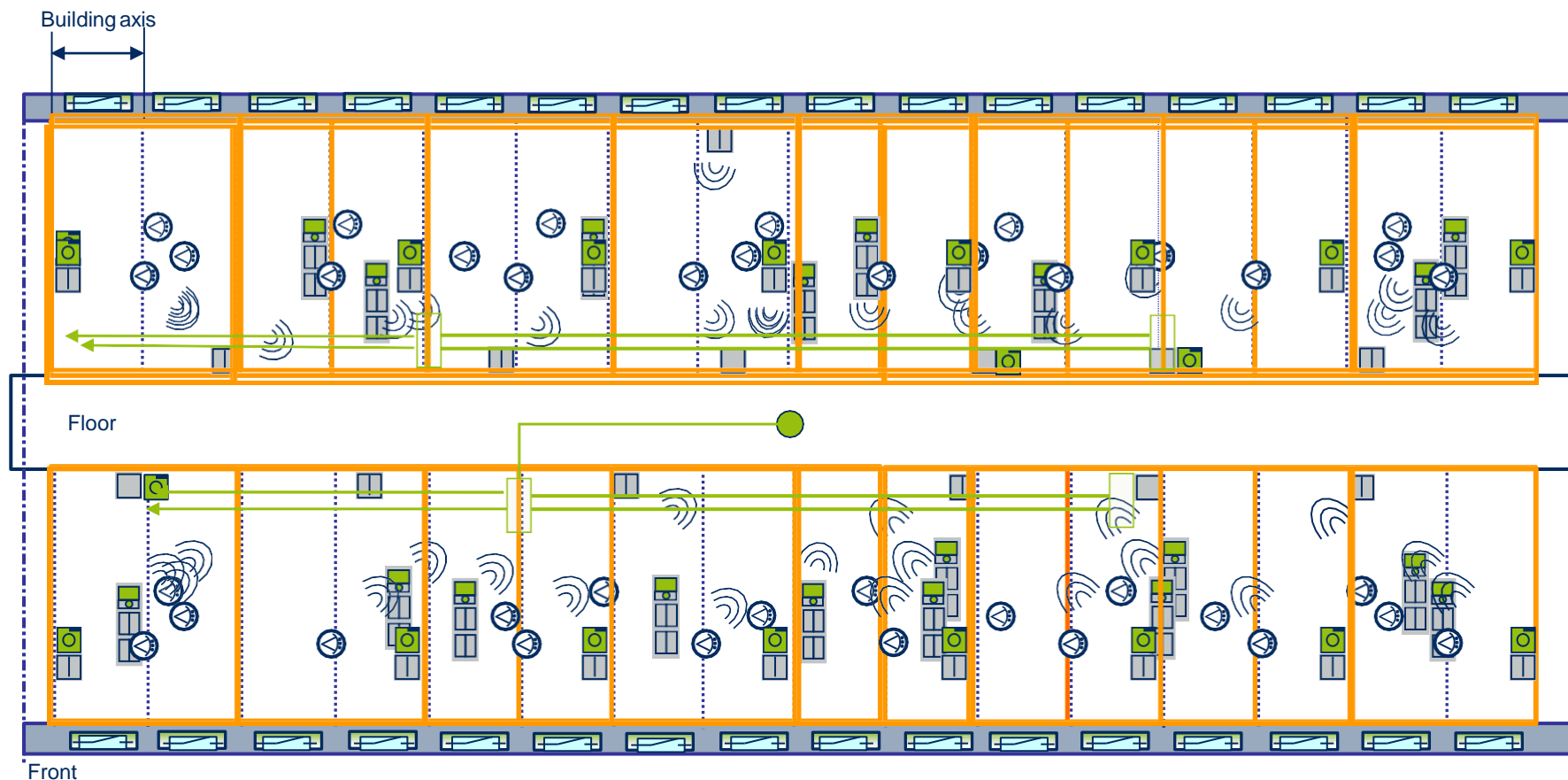
Building automation



Commercial buildings: axis-orientated installation with room controller



Functional buildings: flexible room structures with wireless technology



EnOcean Wireless Standard = Maximum Flexibility

Commerical buildings: advantages for the user

- High **energy efficiency** due to optimal building automation
- **Simple planning** - Easy adjustment if changes occur during the building phase
- Highly **flexible office areas**
- **Lower running costs** with changes in room structure or after a change in tenants



Commercial buildings: Advantages for installers and planners



- Easy planning and highest flexibility through freely positionable sensors
- Less noise and dirt
- Flexible room layout
- Upgradeable and expandable at any time
- Wide range of interoperable products and manufacturers
- Compatibility with other building automation systems (e.g. EIB/KNX, LON, BACnet und TCP/IP)

Commercial buildings: The Squire (AirRail Center)

■ **The Squire – Frankfurt, Germany**

- 12.000 batteryless wireless modules from EnOcean



Over 250.000 buildings worldwide –
„enabled by EnOcean“



Offices

Hospitals

Industrial buildings

Residential buildings



Hotels

Historical buildings

Stores

Schools/ Universities

- Why wireless & batteryless?
- EnOcean – the batteryless wireless technology
- Installation
- **Radio: Basics & planning**
- Support & next steps

■ Range of wireless signals



- Wireless signals are electromagnetic waves – the **field strength** at the receiver **decreases as the distance to** the emitter **increases**
- In order to achieve maximum range, **visual contact is not sufficient**
- A **free zone** (Fresnel zone) **is required** between transmitter and receiver; this zone is an ellipse
- **No interference from other wireless frequencies** and radio applications such as Wi-Fi, garage doors, weather stations

Basics of radio signals in praxis

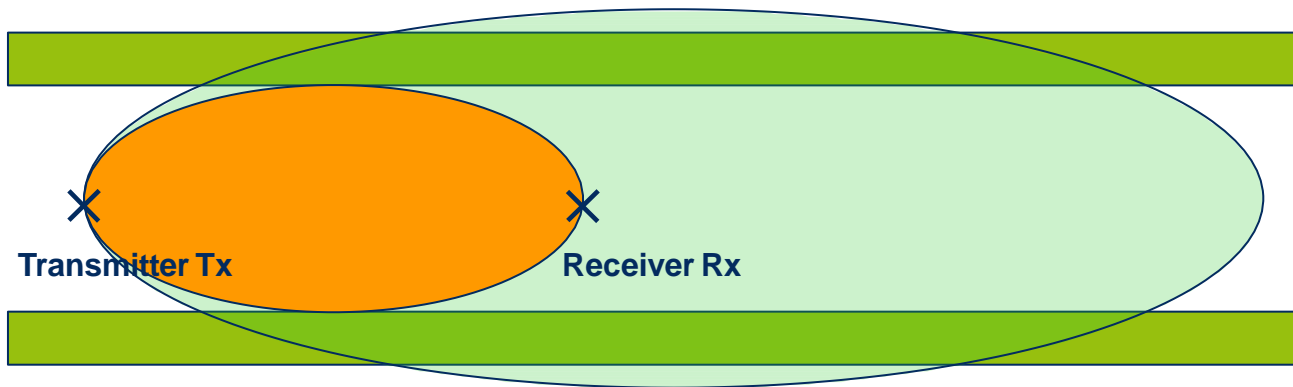
Typical range in practice

- **In a building with ideal conditions**
 - **30m**, large open space
- **It's best practice to plan max. 15m (planning security)**
 - Possible losses due to furniture, persons, subsequent walls



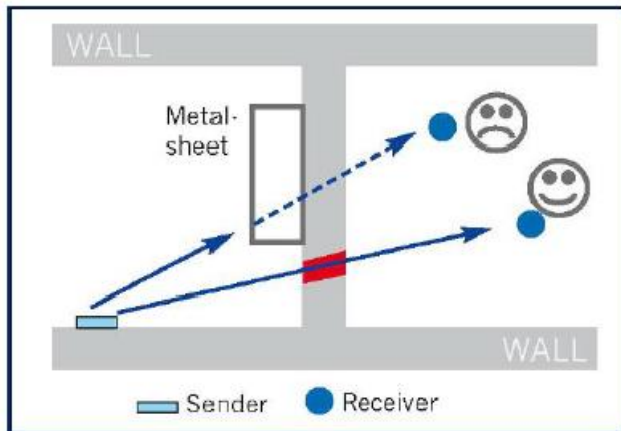
Basics of radio signals

- Radio transmission occurs as an ellipse
- For maximum range, 'line of site' is not sufficient



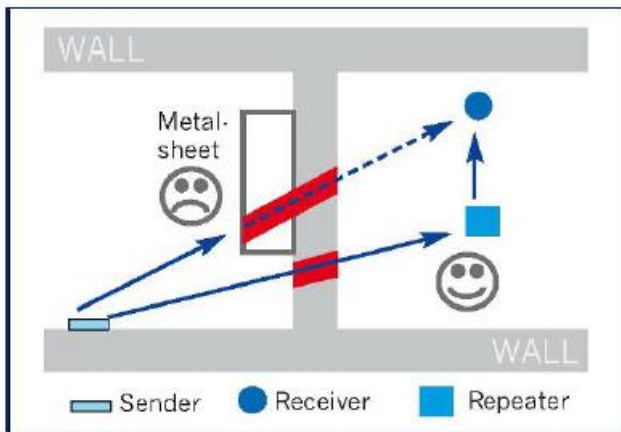
At a 30m range, the ellipse centre is theoretically around 10m. Narrow corridors with massive walls are therefore unfavorable.

Basics of radio signals – absorption



■ Absorption

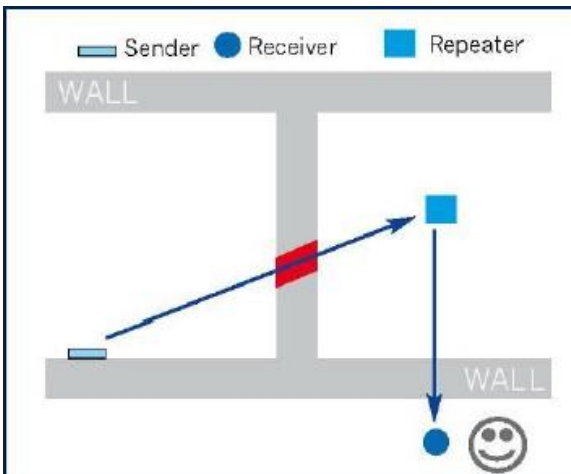
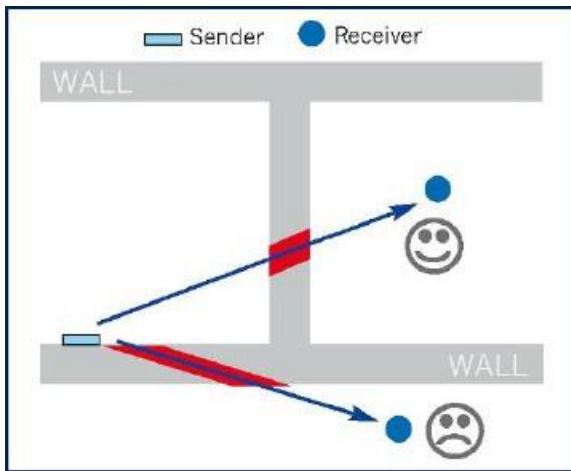
- Radio can penetrate walls – but signals are absorbed
- Absorption rate depends on material



■ Examples

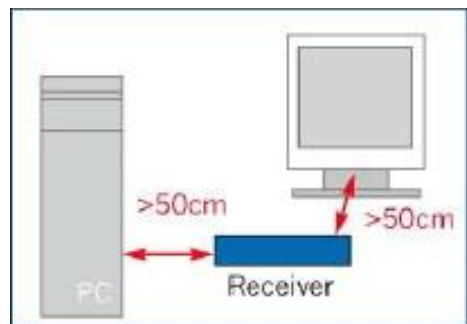
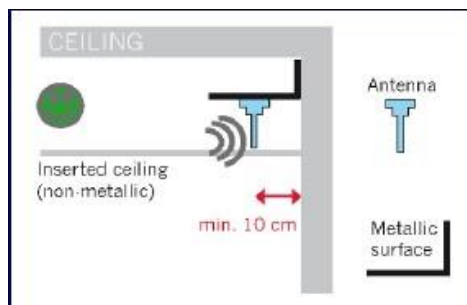
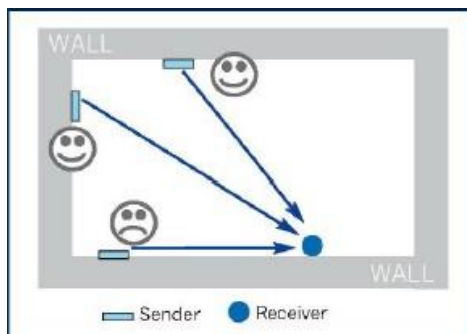
- Wood, plaster, uncoated glass, no metal
0 – 10%
- Bricks, press boards 5 – 35%
- Concrete with iron reinforcement 10 – 90%
- Metal, aluminium lining 90 – 100%

Basics of radio signals – penetration angle



- Depending on the angle, the effective wall strength and absorption of the signal changes
- Whenever possible, the **signals** should go **vertically** through the walls. Niches in walls are to be avoided
- If flat penetration angles occur, **repositioning of transmitter and/or receiver antennas** or the use of a repeater is recommended

Basics of radio signals – antenna installation & sources of interference



- **Radio coverage along a wall area is to be avoided** (e.g. also in a long corridor)
- Whilst laying out a shielded antenna cable, **take note not to bend the cable**, to do so could damage it beyond repair
- The **distance** from the EnOcean receiver to other high frequency transmitters should **be a of min. 50 cm**, the position isn't critical. 868 MHz-RFID shouldn't be used in the same room

Optimal positioning of solar-based sensors



- **Ambient light > 50 lux:**
powers sensor and charges super capacitor



- **3 hours with 200 lux:**
enough energy for 14 hours in darkness



- Fully charged devices can function
3 -5 days in darkness

Required amount of light in buildings

■ School

■ Blackboard	500 – 1000 lx
■ Typical schoolroom	300 – 500 lx

■ Office building

■ PC-work place	200 – 500 lx
■ Conference room	300 – 700 lx
■ Corridor	50 – 100 lx

■ Hotel

■ Reception	300 – 700 lx
■ Restaurant	150 – 300 lx
■ Staircase	50 – 150 lx

Range planning : tools

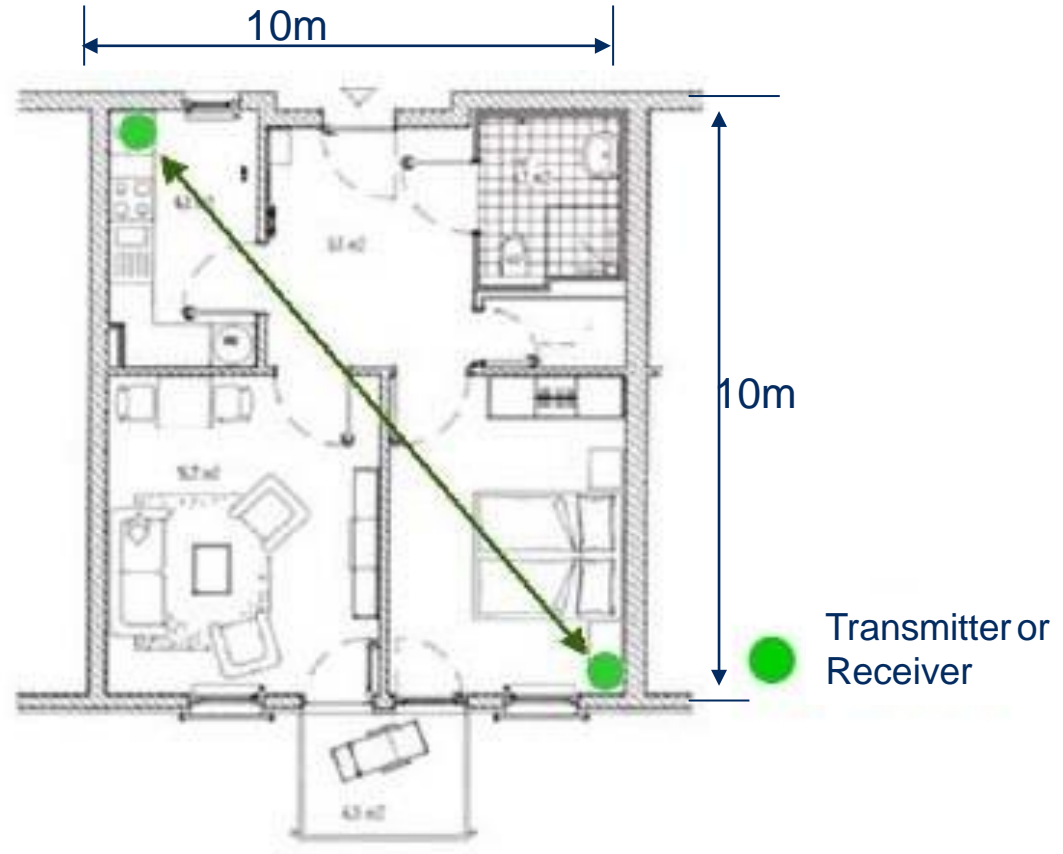
- **EPM 300** to check the possible range in buildings or outside
- Level 1- and Level 2-**repeater**
- **System optimization possibilities:**
transmitters are received by 2 gateways
- **Information brochure „Range Planning Guide“** to download:

http://www.enocean.com/fileadmin/redaktion/pdf/app_notes/AN001_RANGE_PLANNING_2013_en.pdf



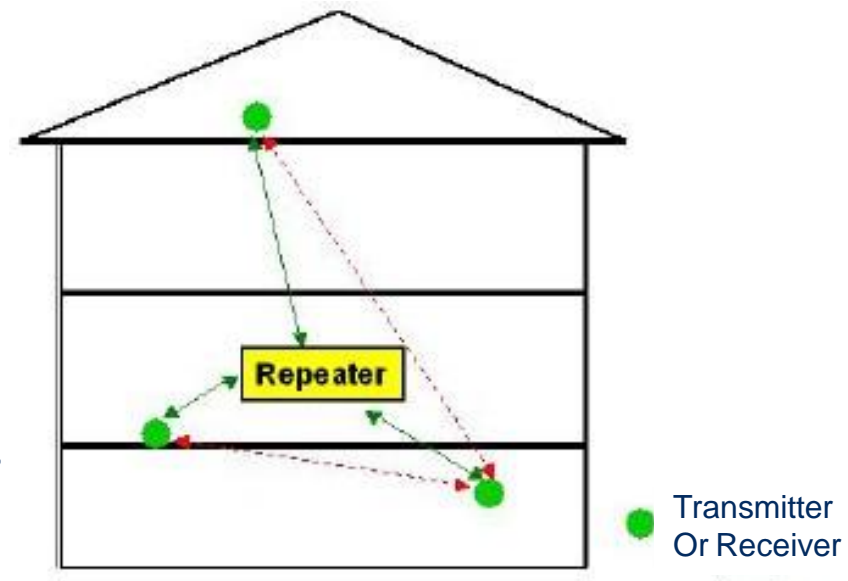
Range planning for residential buildings

- **Repeater not normally needed**
- Normal wall strength
- No aluminum / foil lining in walls



■ Repeater are recommended

- At central point
- Many actuators already have integrated repeater functions



Range planning in commercial buildings: Step 1

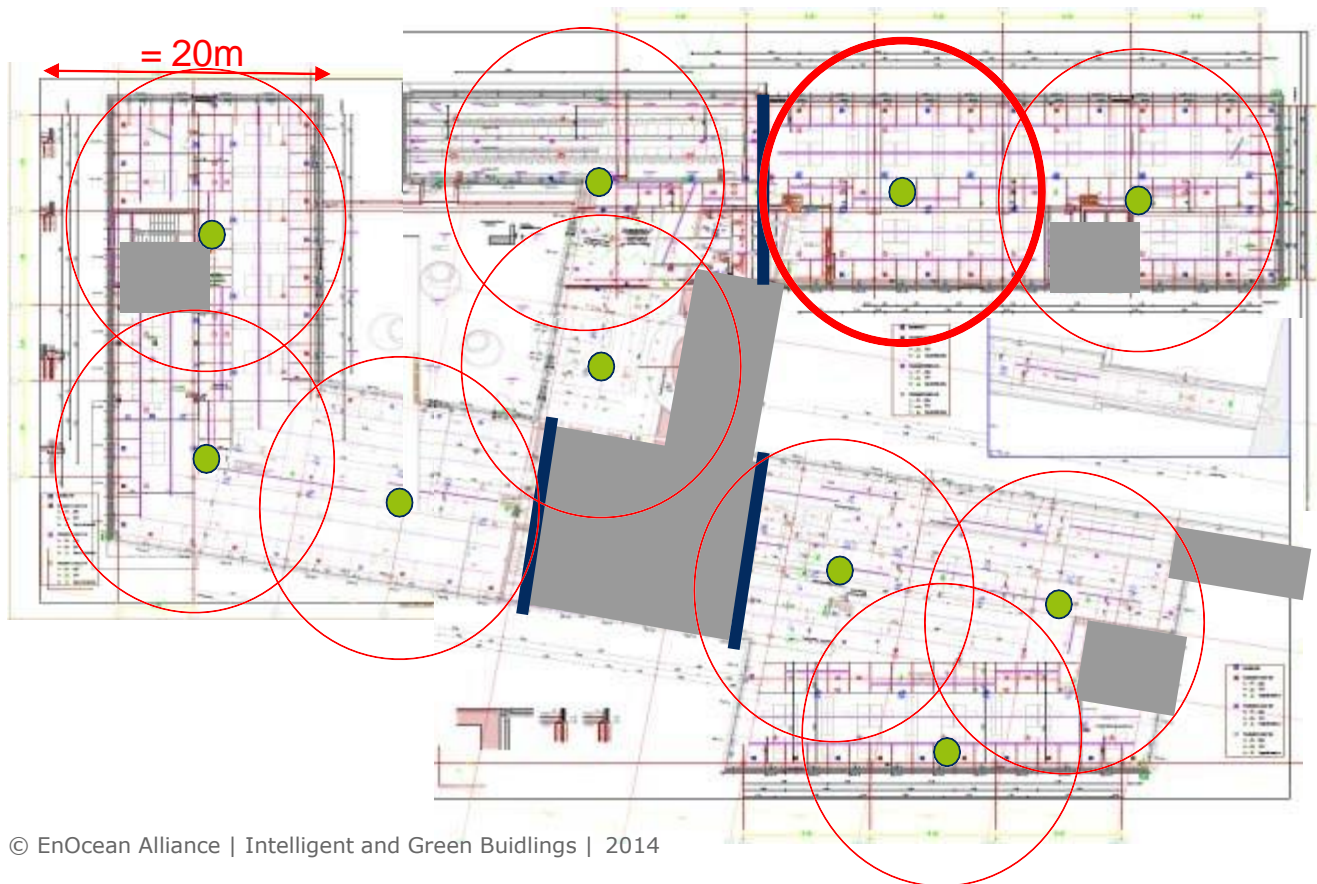
- **Take a Building Floor Plan and a Drawing Circle**
- **Mark relevant Radio Shadings into the Floor Plan**
 - Fire Protection Walls
 - Lavatories, Staircases, Elevator Shafts, Supply Areas....



Range planning in commercial buildings: Step 2

Draw in the receiving radii 10m–15m

- 10m-radii guarantee enough planning reserves
- Circle center = receiver position (+/- 1m is ok)



Range planning in functional buildings: Connectivity to automation systems



- **Gateways can also be added to existing building automation systems.**



■ **Approach:**

- Which central building control system is used?
- Which applications are desired?
- Which products are to be used?
- How many emitters per unit (axis, area, etc.) are desired?

- Why wireless & batteryless?
- EnOcean – the batteryless wireless technology
- Installation
- Radio: Basics & planning
- Support & next steps

Start now with EnOcean!



■ Simple entry: retrofit with a decentralized solution

- e.g. a switch and an actuator
- Search for a fitting solution from over 1.200 interoperable products

■ More information and training can be found directly at the OEMs

<http://www.enocean-alliance.org/en/wheretobuy/>



Products –

<http://www.enocean-alliance.org/en/products/>



enocean[®]alliance

No Wires. No Batteries. No Limits.

Self-powered Wireless
Switches & Sensors and
Controls

Where to Buy

Energy Harvesting Wireless
Technology

EnOcean Wireless Standard

Self-powered Wireless Switches & Sensors and Controls

Building Automation Sensors & Controls "Enabled by EnOcean"

Frequency/Region

- ☐ 315 MHz (e.g. America, Japan)
- ☐ 868 MHz (e.g. Europe, China)
- ☐ 902 MHz (e.g. USA, Canada)

Application

- ☐ Lighting
- ☐ HVAC
- ☐ Industrial

Manufacturer

- ☐ Ad Hoc Electronics
- ☐ Adura Technologies
- ☐ AFRISO
- ☐ Akktor
- ☐ alphaEOS
- ☐ AWAG
- ☐ b.a.b.-technologie

Categories

- ☐ **Wireless Switches**
 - ☐ Wall Switch
 - ☐ Key Card Switch
 - ☐ Remote Switch
 - ☐ Industrial switch
 - ☐ Switch Misc.
- ☐ **Wireless Sensors**
 - ☐ Temperature Sensor
 - ☐ Position Sensor
 - ☐ Occupancy Sensor
 - ☐ Light Sensor
 - ☐ Humidity Sensor
 - ☐ CO2 Sensor
 - ☐ Water Sensor
 - ☐ Warning Sensor
 - ☐ Metering Sensor
- ☐ **Receivers & Controllers**
 - ☐ Actuator/ Relay Receiver
 - ☐ Room Controller
- ☐ **Gateway & Building Management Systems**
 - ☐ Gateway
 - ☐ Software
- ☐ **Accessories**
 - ☐ Accessories Misc.
 - ☐ Repeater

Filter by keyword

Reset all Filters X

Close Advanced Search ^

Apply Filter ↺

Where to Buy >

Solution Finder >

[Print list](#)

[Save list as excel file](#)

1212 hits

Find your solution –

<http://www.enocean-alliance.org/en/solutionfinder/>



ean[®]alliance
No Wires. No Batteries. No Limits.

Solution Finder

Office Buildings

Hotels

Smart Homes

Hospitals

Retail Buildings

Schools

Industrial Buildings

Historical Buildings

References

Solution Finder

Find your energy-harvesting wireless solution for your sustainable building

Where to Buy >

Step
1
Your Choice
Market Segment


2
Application Area

3
Region/Frequency


I am looking for a solution for...



Hotels



Hospitals



Schools



Industrial Buildings

Available here –

<http://www.enocean-alliance.org/en/wheretobuy/>



Self-powered Wireless
Switches & Sensors and
Controls

Where to Buy

Energy Harvesting Wireless
Technology

EnOcean Wireless Standard

Where to buy Building Automation Sensors & Controls "Enabled by EnOcean"

Companies offering Building Automation Products, Systems and Services

Displaying results 1 to 64
out of 349

64 hits per page

Narrow your
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Company Category



All

Application



All

Geogr. Availability



All

[Page 1](#) [Page 2](#) [Page 3](#) [Page 4](#) [Page 5](#) [Page 6](#) >

Company	Company Category	Application	Geographical Availability	Action
 BSC Promoter	Product Manufacturer	HVAC Lighting	Europe	Details
 EnOcean Promoter	Product Design & Test Services	HVAC Industrial Lighting	Europe, North America, Central and South America, Asia, Middle East, Africa and Australia	Details
 Ex-Or Promoter	Product Manufacturer	Lighting	Europe	Details
 MK Electric Promoter	Product Manufacturer	HVAC Lighting	Europe, Middle East, Africa and Australia, Asia	Details
 OPUS greenNet Promoter	Product Manufacturer, Sales Partner, Building Professionals	HVAC Industrial Lighting	Europe, Middle East, Africa and Australia	Details

References –

<http://www.enocean-alliance.org/en/references/>

Solution Finder

Office Buildings

Hotels

Smart Homes

Hospitals

Retail Buildings

Schools

Industrial Buildings

Historical Buildings

References

References

Self-Powered Wireless Switches, Sensors and Controls for Building Automation

The self-powered wireless radio technology of EnOcean is already since 2003 a worldwide application standard in over 250,000 buildings. Find here selected case studies.

- Office Buildings
- Hotels
- Hospitals & Assisted Living
- Residential Buildings
- Retail Buildings
- Schools
- Industrial Buildings
- Historical Buildings (e.g. Churches, Castles)
- Other Applications (e.g. yacht)

Office Buildings



Business + Innovation Center Kaiserslautern (Germany) - 2012

More flexibility for 4000 sqm building.
[More Info](#)



Lava Beds National Monument Park (USA) - 2012

New wireless equipment for park administration.
[More Info](#)



Barclays Headquarters (UK) - 2012

References in North America

> [Overview \(pptx\)](#)

More Information

- > [EnOcean Technology](#)
- > [Products "Enabled by EnOcean"](#)

White Papers

- > [EnOcean Technology and LEED](#)
- > [BACnet and EnOcean](#)
- > [LonMark International and EnOcean Alliance](#)
- > [KNX and EnOcean](#)

Image Movie



Useful information



- **Coverage planning:**

http://www.enocean.com/fileadmin/redaktion/pdf/app_notes/AN001_RANGE_PLANNING_2013_en.pdf

- **Brochures:**

<http://www.enocean-alliance.org/en/downloads/>

- **Technical information:**

http://www.enocean-alliance.org/en/white_papers/

- **Videos:**

www.youtube.com/user/EnOcean

- **Social Media**

- Twitter: <http://twitter.com/enoceanalliance>

- Facebook: www.facebook.com/pages/EnOcean-Alliance/109269292485427

- LinkedIn: <http://www.linkedin.com/groups?mostPopular=&gid=3578554>

- Google+: <https://plus.google.com/u/0/107585984916165196922>



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